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ABSTRACT

The purpose of this study was to examine the relationships between cultural differences and the design of personal Web pages. The research questions were: (1) What differences can be detected between how American and Chinese students employ symbol systems in their personal Web pages? (2) What differences can be detected between American and Chinese students with respect to information preferences and content structure as revealed within their personal Web pages? and (3) How does culture influence the design and development of personal Web pages by American and Chinese students? Content analysis was conducted of Web pages by 28 American and Chinese university students, and 10 students were interviewed after their Web pages were analyzed. Findings of the study are summarized in reference to the three central research questions that guided the investigation. (AEF)

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The Relationships Between Cultural Differences Among American and Chinese University Students and the Design of Personal Pages on the World Wide Web

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Introduction

Culture is a pervasive force among people that shapes personality traits and problem-solving tactics, affects thinking processes, and influences lifestyle preferences. The establishment of cultures is distinguished by creating, operating, and manipulating symbols. The unique characteristics of each culture are revealed by the symbol systems created by the people within that culture, and culture plays a significant role when people create and design artifacts.

As we approach the 21st century, the computer has become an increasingly important tool for creating and sharing cultural artifacts. The World Wide Web is gradually coming to dominate communications and commerce leading to increased globalization of fundamental activities such as buying clothing, obtaining medical advice, and creating art. Within education, practitioners and researchers alike have predicated a bright future for the WWW, especially in higher education where the twins goals of increasing access and enhancing quality are often pursued.

Publishing student projects on the WWW can increase "authenticity" of student-developed artifacts because students can foresee a large audience for their work. In addition to the sense of audience, the creative outlet of constructing web pages may help improve both cognition (e.g., design skills) and motivation (e.g., the desire to express oneself). With the spread of easy-to-use, inexpensive (or even free) authoring systems, the development of personal web pages has rapidly flourished in higher education. Publishing personal web pages is not only a social process, but can also be a learning activity. Student creation of web-based representations of their own mental models of processes and phenomena has great potential for supporting learning. However, little is known about how student preferences for using different symbol systems, selecting content, and organizing the structure of web pages influence their designs and ultimately shape their learning.

The acquisition of most forms of knowledge cannot be separated from the involvement of symbol systems. Salomon (1994) asserted that knowledge acquisition and cognitive development are enabled through the mediation of cognitive symbolic functions. A fundamental proposition in Salomon's theory is that symbol systems interact with individual differences in cognitive development. Most importantly within education contexts, different symbol systems evoke different learning styles, cognitive processing, and information preferences. The symbol systems that people encounter and the information extracted correspond closely to the social environment in which the people live as well as their cultural heritage.

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The myth that computers have no boundaries in the "information age" implies that "technology is culturally neutral." Although the computer originated within Western culture, researchers and developers have created universal interfaces for the WWW and other computer applications that can be recognized and utilized by people from many different cultures. However, culture still has a role in the development and use of computers. An assumption underlying this study is that personal web page designs are also influenced by cultural factors. The research described in this paper was designed to help close the gap in knowledge about how student web pages are influenced by cultural differences (Chu, 1999).

The primary purpose of this study was to examine the relationships between cultural differences and the design of personal web pages. The research questions were: 1) What differences can be detected between how American and Chinese students employ symbol systems in their personal web pages? 2) What differences can be detected between American and Chinese students with respect to information preferences and content structure as revealed within their personal web pages? 3) How does culture influence the design and development of personal web pages by American and Chinese students?

Methodology

To examine the differences in employment of symbol systems, selection of information, and structures of content between American and Chinese students and to explore how culture influences the design decisions made during web page design, two qualitative methods, content analysis and interviewing, were employed to achieve interpretivist (descriptive) goals for this research. Specifically, the first author analyzed the content of web pages created by 28 American and Chinese university students and interviewed 10 students after analyzing their web pages.

Various approaches were used to recruit participants, including searching on the Internet, nominations, and advertising on campus. The criteria for selection included the size of the web site (each site had to have three or more pages) and the variety of information included in the web site (at least two topics had to be conveyed in the web site). A total of 28 students participated in this study, including 10 American students at The University of Georgia (UGA), 9 ethnic Chinese students at UGA, and 9 ethnic Chinese students from universities in Taiwan. Each of the participants completed a questionnaire via the Internet for the purpose of obtaining background information about such factors as gender, previous computer experience and academic major. Each of the participants' web sites was reviewed and carefully analyzed to identify the characteristics of the sites within two categories: symbol systems and content information. Subsequently, to identify how culture influences students' web page design and development, semi-structured interviews were conducted with five American and five Chinese students on the UGA campus. The in-depth information gathered from each interview was transcribed and analyzed to identify culture-specific concepts used in web page design.

Results

The average age of the American group, Chinese group, and Taiwanese group were 25 (range 18 - 41), 28 (26 - 41), and 20 (19 - 23) years respectively. The average hours that the participants spent developing their web pages were 24 hours, 50 hours, and 60 hours respectively. Obviously, the Chinese and Taiwanese groups spent much more time than the American group of students in creating personal web pages. Interestingly, American participants

generally reported themselves as having higher competence levels with web page skills than Chinese and Taiwanese participants. In addition, American participants expressed more confidence in their computer skills and abilities than the Chinese or Taiwanese students. American participants were also very satisfied with their own web page designs. By contrast, Chinese and Taiwanese participants were more conservative in their opinions about their own web page designs. For example, in the Taiwanese group, 33% of the participants expressed dissatisfaction with their own designs.

The findings of the study are summarized below in reference to the three central research question that guided this investigation:

Question 1. What differences can be detected between how American and Chinese students employ symbol systems in their personal web pages?

The differences found in the web sites created by three groups of university students (i.e., American, Chinese at UGA, and Taiwanese groups) are listed by categories as follows:

Opening pages: An opening page is like a book cover that is put before the directory page. In this sample, the American and Taiwanese groups created opening pages more often than the Chinese at UGA group.

Title: Chinese participants used the traditional title (i.e., developer's name and the words "welcome," "homepage," or "world") in text style more often than the American or Taiwanese group. Taiwanese participants preferred using alias titles and creating the title in graphical text.

Language: Although the dominant language in Taiwan is Chinese, Taiwanese participants either created an English version of their pages or included English in their pages.

E-mail: All of the participants in the American and Taiwanese group provided e-mail addresses and writing functions on their web site. However, most of the Chinese participants did not include writing functions on their e-mail symbols. As for the description of e-mail, Chinese participants tended to use e-mail addresses, while American and Taiwanese preferred to add text other than "e-mail me" to encourage viewers to correspond.

Graphics: The most popular graphics that the Americans used are logos or icons. The second most popular graphics in the American group are animals, toys, or cartoons, and objects related to direction (e.g., arrows, doors, and houses). The Chinese group did not show any favorite graphic type, while Taiwanese participants preferred graphical characters.

Directory arrangement: The Chinese group preferred to itemize directories, while the American group preferred to use descriptive text. All of the Taiwanese participants listed all their personal information as items in directories.

Other factors: The Taiwanese web pages tended to include a counter and date and time indicators, and they were also more likely to provide browser and computer monitor resolution information for optimal viewing.

Question 2. What differences can be detected between American and Chinese students with respect to information preferences and content structure as revealed within their personal web pages?

Differences in content and structure found in the web sites created by three cultural groups (American, Chinese at UGA, and Taiwanese) included the following:

American group versus Chinese group: American participants provided more

information in the career/profession, friends, and interest categories. Chinese participants preferred to present education, Internet news links, and social life links.

American group versus Taiwanese group: The American group presented career/profession, family, and religious information, while Taiwanese participants preferred self-description, artifact, communication, interest, entertainment, and social life links.

Chinese group versus Taiwanese group: The Chinese group presented more education, family, and Internet news links than Taiwanese group. The Taiwanese group provided more information than the Chinese group with respect to self-description, artifacts, communications, interests, and entertainment links.

Question 3. How does culture influence the design and development of personal web pages by American and Chinese students?

Cultural differences were found in the web sites through the content analysis and interpretation of interview data. The findings emerged as nine categories that were labeled: 1) expression of affection, 2) family and religion 3) spatial and verbal preference, 4) "Chinese is who I am," 5) art and sex, 6) "I change it because you said so," 7) "I do it for you," 8) conformity to instruction, and 9) positive and negative attitude to design. These cultural differences were further classified into five different aspects (expression, communication, social relationship, social cultural context, and learning styles) that directly and indirectly affect what content information and symbol systems are presented on web sites created by university students.

If it can be accepted that there are meaningful differences among the web sites created by American, Chinese, and Taiwanese university students and that these differences are related to cultural differences, what are the primary cultural factors involved? In order to understand better the cultural meanings of these differences between American and Chinese groups, the results were compared across four categories, 1) Confucianism and individualism, 2) social norms, 3) language learning, and 4) educational conceptions. These categories are elaborated below.

Confucianism versus Individualism

Confucianism has been rooted in Asia for more than 2400 years. Although condemned during China's Cultural Revolution and criticized for its pragmatic values in contemporary modern society, Confucius has had great impact on the culture and value system in Chinese society. Confucianism has endured as the basic social, value, and belief system in East Asia, as it was adopted as the official philosophy during the Yi Dynasty in Korea, the Tokugawa Shogunate in Japan, and many dynasties in China.

Confucianism is a philosophy emphasizing self-cultivation and self-control. Its primary purpose is to establish proper human relationships as the basis of a harmonious society. "Jen" is the cardinal principle of Confucianism, which can be directly translated to "humanity," or interpreted as "warm human feelings between people." Both of these meanings refer to the reciprocal relationship between people. As a result, to sacrifice personal goals and needs to the family and to society is expected of Chinese people. These kinds of family-centered and social-centered principles are deeply implanted in people's thinking and influence the ways of living as moral and intellectual doctrines in East Asia.

In contrast to Confucianism, the individualism so prevalent in American society emphasizes independence, autonomy, and freedom of speech and choice. American society is imbued with the values of individualism and thus American people are socialized to assert their

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interests openly and to strive for self-actualization throughout their lives. The prime focus of individualism is to achieve personal interests, needs, and goals, and hence, in the USA, an individual goal is usually more important than the group goal.

The distinct differences between Confucianism in Chinese society and individualism in American society are reflected in the cultural differences evident in the students' web pages. These differences are especially obvious with respect to communication style, interpersonal relationships, and attitudes toward education.

Communication style. Western society has a long history of liberal speech, dating back to Aristotle, the Hadean Park in England, and the American constitution protecting freedom of speech as a major right for all people. The tradition of freedom of speech encourages people to talk and express themselves more freely than in Asian society. To the contrary, Chinese society encourages people to speak less and listen more." This notion is evident in the *Analects* of Confucius: "action yet cautious in what to say," "slow to speak yet quick to act," "It is rare thing for glib speech and an insinuating appearance to accompany authoritative conduct," and "in expressing myself, it is simply a matter of getting the point across." These excerpts admonish people to think deliberately and carefully before speaking. These maxims form the guidelines for communication styles in verbal expression in Chinese society. Thus, two different types of communication patterns, which are liberal and conservative of affection expression, were found in this study. In the American group, Lora, Kim, and James presented in their web pages or freely talked about their affection for family, friends, and religion; whereas among the Chinese participants, the same type of communication was not evident within the web page design or during interviews. Furthermore, Chen remarked that the reason why she did not present her husband's picture on her web page is that Chinese don't show affection in public.

Interpersonal relationships. The entire book *Analects* conveys the ideal interpersonal relationship for establishing a harmonious society. An ideal society, as pictured by Confucius, is "filial at home and deferential in the community." When individual merit conflicts with society's merit, the personal merit is sacrificed for the benefit of the society, as described in an excerpt from the *Analects*, "For the resolute scholar-apprentice and the authoritative person, while they would not compromise their authoritative conduct to save their lives, they might well give up their lives in order to achieve it." On the other hand, Western society is dominated by individualism and emphasizes fairness and equality. Chinese society highlights the benefits of society or community. This social-centered concept means that Chinese attach much importance to interdependent relationships in the society. This factor influenced Lee to change her "My Friends" page, Chen not to remove her entire web site, and Zhao to complain that none of Taiwanese students at UGA looked at his web site.

Attitude to education. Admiration for scholars, schools, and academics has a long tradition in Chinese society. The reverence for education in East Asia is attributed to Confucius in two ways: equally opening education for all and establishing "an enduring and decisive link between education and political power." The former promotes the concept that all people have an equal chance to be cultivated and educated. The latter is an ideal dream for educated people to fulfill the life goal of administering national affairs or governing the nation. Thus, an educated man or a scholar, even one who is poor and powerless, commands more respect than someone who is wealthy or powerful. In Chinese culture, it is expected that students conform to and comply with educators. Further, the higher social position of a scholar makes people strive for

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higher education. As a survivor of the Cultural Revolution in China, Chen is an example of a Chinese student striving against heavy odds for a higher educational degree, even though she titles herself a "grandma student." Those Chinese participants who designed their web pages by closely following the directions given by their teachers also reflects Chinese cultural expectations.

Social Norms

Social norms serve as the standard guidelines for social interactions and operations. Social standards or norms have different classifications or meanings across cultures. What may be normal for one culture may be taboo for another. For example, parents disciplining children with a mild beating is hardly ever called child abuse in Chinese society, whereas American society has become more strict in the definition of child abuse. In America, it is normal to send parents to a nursing home when they get old. In Chinese society, such behavior would be condemned as not being filial to the parents if the grown-up children did not take on the responsibility of caring for their elderly parents.

Age and marriage are other social norms that differ between American and Chinese society. Americans do not appear to have many strict standards about age and behavior. Whereas elderly Americans can dress like much younger people, it is rare to see a 50 or 60 year-old Chinese man or woman wearing blue jeans. Marriage in Chinese society has restrictive social standards; that is, the husband should be older, have a higher educational degree, and earn more money than the wife. In the Chinese community, one would not expect to find a female professor married to a taxi driver who has only a high school diploma whereas such arrangements are common in American sitcoms on television. As noted above, social norms determine the form and define the interpretation of a person's behavior in a culture. Chen's concern about age and marriage affected how her web site was designed and how information was provided. She said, "I should act like my age." Lee took off a painting of a naked woman after she was reminded by her peers that a naked woman stands for a sexual and lust symbol in Chinese cultural norms, even though the image was a famous painting. Zhao created two pages for his future babies because having babies is expected for a married Chinese couple and such an event is greatly anticipated by family and friends.

Language Learning

During the interviews, Chinese participants emphasized the overall arrangement of text, graphics, and colors in their web pages, while American participants did not focus as much on the organization of their web pages. This difference may be related to language learning, especially with respect to visually coding experiences in the learning of characters. According to Bennett's (1990) field-independence (FI) and field-dependence (FD) measures, Chinese tend toward spatial preferences (FD) and Americans tend toward verbal preferences (FI). Hoosain (1986) argued that "Chinese is related to visual perceptual processing as well as visual coding which are not similarly entailed in alphabetic or syllabic orthographies" (p. 511). The visual coding refers to how Chinese characters are identified and memorized in the Gestalt sense. When young students are learning how to recognize and write Chinese characters, the spatial relationships among strokes and among radicals are taught so that students will remember to distinguish each and every Chinese character. The beauty of a calligraphy is not only how the strokes are drawn, but also how they are arranged and organized in a consistent and harmonious way. This intense visual coding training may result in a tendency to employ spatial perception

when Chinese design their web sites. Lee emphasized aesthetics, consistency, and harmony of organization of text, picture and other symbol systems; Chen focused on simple and plain design; Sun and Zhao talked about their layout of web pages and how to make it more appealing with spatial arrangement. However, American students, such as Jim, James, King and Lora, focused on what information was presented rather than how it was presented on their web sites. Their designs were more haphazard.

Educational Conceptions

In Chinese society, the educational system stresses learning as outcome-oriented (Gardener, 1989; Winner, 1992); that is, students' learning outcomes are more emphasized than the learning processes. This educational concept has a historical and cultural background in Chinese society and is totally different from the contemporary Western approach, which is individualistic and encourages independent thinking, self-reliance, and self-actualization. The Chinese believe in reciprocal, interdependent relationships. Heritage is conveyed to the next generation through education; to pass down experiences, knowledge, and wisdom to descendents is to avoid the mistakes that were previously made. This notion was evident in Sun's interview. She said that Buddhism changed her life when she had emotional conflicts. But her nephew, who she thinks has a similar personality as hers, behaves well because she directed him to prevent the struggles she encountered.

Chen agreed with her teacher's approach (i.e., to assign very detailed requirements for web page projects) for instructing students. For Chen, such well-organized instruction and detailed requirements are a benefit for students whereas an American student might regard them as overly restrictive. Chen's reaction reflects the instructions she received as a young student, such as to learn how to write characters, calligraphy, and Chinese painting. Further, in China, students are only allowed to use and display one processing approach taught by the teacher when practicing mathematics whereas American students are encouraged to solve problems in unique ways.

Another educational difference between Americans and Chinese exists with respect to the attitude towards goals. If a student wishes to be a garage mechanic, Chinese teachers and parents will condemn the child for having no ambition, while many American teachers and parents will probably just smile and encourage the child to fulfill him or herself. (This acceptance may not be as evident in all levels of America society.) This concept suggests that performance is judged according to higher standards in Chinese society. This may explain why Chinese participants in UGA or in Taiwan were neutral towards or not satisfied with their own web page designs whereas the American participants seemed quite pleased with their efforts.

Recommendations for further research

Due to financial limitations and logistical considerations, interviews with Taiwanese participants were not conducted in this study. Because analysis of the content information and symbol systems showed cross-differences among the three groups, interviews with Taiwanese students should be implemented to identify cultural differences and social-cultural context differences among American, Chinese, and Taiwanese students. For example, the differences in content information found between the American group and the Chinese group are not equivalent to the differences found between American and Taiwanese participants. In addition, the comparison of Chinese and Taiwanese groups indicates some significant differences as well as

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similarities in content information. These interesting results need further exploration to identify the causes of the differences among the three groups.

Age, gender, and degree objective were not compared in this study. Some of the differences found in the web sites may correlate to the differences in age, gender, and degree objectives. For instance, most of the American participants and all of the Taiwanese participants were undergraduate students, while most of the Chinese participants at UGA were doctoral students. The percentage of males in the American group was 70 percent, in the Chinese group was 33 percent, and in the Taiwanese group was 89 percent. The age ranges also differ among the three groups. Further research is needed to reveal the interactions among cultural factors and age, gender, degree programs, and other factors (e.g., access to new technology).

Hypermedia learning environments such as web sites are not panaceas, and they cannot be used successfully by all kinds of learners, nor for all different kinds of learning tasks. Hypermedia or multimedia programs should be designed to accommodate differences in learners' learning characteristics and learning tasks. Based on the cultural differences found in this study, further research to examine the interaction effects between hypermedia/multimedia instruction and students from different cultures is needed.

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